

We claim:

1. A monitoring device comprising:

a needle assembly having a needle body, said needle body having an open back end and a pointed tip end and having a sidewall defining a long-narrow lumen extending between said open back end and said tip, said sidewall further defining a plurality of ports;

a fiber optic bundle disposed in said lumen and in communication with said ports;

a radiation source in communication with at least one fiber optic member of said bundle for irradiating an area adjacent the tip end of said fiber optic member; and

a light detector in communication with at least one fiber optic member of said bundle for receiving radiation from an irradiated area.

2. The monitoring device of claim 1, wherein said ports comprise a central port defined by said pointed tip end and at least one side port disposed on said body in an area between said pointed tip end and said open back end.

3. The monitoring device of claim 2, wherein said side ports are disposed on said needle body in a pattern.

4. The monitoring device of claim 3, wherein said side ports are disposed generally equidistantly in a straight line along a length of the body.

5. The monitoring device of claim 3, wherein said side ports are disposed around a circumference of said needle body.

6. The monitoring device of claim 3, wherein said side ports are disposed in a serpentine configuration around a length of said needle body.

7. The monitoring device of claim 1, further comprising a barb connected to said needle to anchor said needle in a specimen to be monitored.

8. The monitoring device of claim 7, further comprising a sensor for receiving and interpreting information communicated from said light detector.

9. The monitoring device of claim 1, wherein said device is adapted for providing signals for spectrophotometric detection of a member selected from the group consisting of oxyhemoglobin, deoxyhemoglobin, NAD, NADH, NADP, NADPH, cytochrome oxidase, and myoglobin.

10. The monitoring device of claim 1, wherein said needle body has a curved portion.

11. The monitoring device of claim 1, wherein said radiation source comprises at least one light emitter, a bispectral emitter, a dual spectral emitter, at least one photoemitter, at least one photodiode, at least one light emitting diode, or a semiconductor die.

12. The monitoring device of claim 1, wherein said sensor comprises a photoelectric receiver, a photodetector, a photodiode receiver, or a semiconductor die.

13. The monitoring device of claim 1, wherein said pointed tip end is adapted to pierce human tissue.

14. The monitoring device of claim 13, wherein said device includes a barb to anchor said needle in a specimen to be monitored.

15. The monitoring device of claim 1, further comprising:

a second needle assembly having a needle body, said needle body having an open back end and a pointed tip end and having a sidewall defining a long-narrow lumen extending between said open back end and said tip, said sidewall further defining a plurality of ports;

a second fiber optic bundle disposed in said lumen and in communication with said ports in said second needle assembly, at one fiber of said second fiber optic bundle are in communication with said radiation source, and at least one fiber of said second fiber optic bundle is in communication with said light detector.

16. A method of detecting or monitoring a physiological condition or a biological phenomena with spectrophotometry comprising:

securing a monitoring device of claim 1 in an area to be spectrophotometrically analyzed;

receiving a signal from an external source;

irradiating at least one fiber optic member of said bundle with electromagnetic radiation for delivery to the area based on the received signal;

receiving radiation at a light detector; and

communicating a detection signal from the light detector to the external signal source configured to decipher a value from the detection signal.

17. The method of claim 16, wherein said condition or phenomena is oxygen saturation of blood in said area.

18. A monitoring device comprising:

a needle assembly having a needle body, said needle body having an open back end and a pointed tip end and having a sidewall defining a long-narrow lumen extending between said open back end and said tip, said sidewall further defining a plurality of ports;

means for carrying electromagnetic radiation, said electromagnetic radiation carrying means in communication with said ports;

means for providing radiation, said radiation means in communication with at least a portion of said electromagnetic radiation carrying means for irradiating an area; and

means for detecting electromagnetic radiation, said detecting means in communication with at least a portion of said electromagnetic radiation carrying means for sensing radiation backscattered from an irradiated area.

19. The monitoring device of claim 18, wherein said electromagnetic carrying means comprises at least one fiber optic member.

20. The monitoring device of claim 18, wherein said radiation means comprises at least one light emitter, a bispectral emitter, a dual spectral emitter, at least one photoemitter, at least one photodiode, at least one light emitting diode, or a semiconductor die.

21. The monitoring device of claim 18, wherein said sensor means comprises a photoelectric receiver, a photodetector, a photodiode receiver, or a semiconductor die.

22. The monitoring device of claim 18, further comprising anchoring means for securing said device to an area to be monitored.

23. The monitoring device of claim 22, wherein said anchoring means comprises at least one barb.

24. A monitoring device comprising:

a needle assembly having a needle body, said needle body having an open back end and a pointed tip end and having a sidewall defining a long-narrow lumen extending between said open back end and said tip, said sidewall further defining at least one light emitting port and light receiving port;

a fiber optic member disposed in said lumen and in communication with at least said light emitting port;

a light detector in communication with said light receiving port for detecting light emitted from said light emitting port.

25. The monitoring device of claim 24, wherein said needle body comprises first and second prongs, wherein said first prong includes said light emitting port and said second prong includes said light receiving port.

26. The monitoring device of claim 24, wherein said needle body comprises an arcurate configuration, wherein a first area of said arc has a light emitting port on the concave side and a second area of said arc has a light receiving port on the concave side.